

What Is Claimed Is:

1. A TV signal receiving tuner for receiving TV signals by dividing them into a plurality of frequency bands, comprising:

a local oscillator which oscillates at a frequency range corresponding to a TV signal having a predetermined frequency band;

a first programmable divider which receives a local oscillation signal of the local oscillator and divides the local oscillation signal; and

a first mixer which mixes the received TV signal and the output of the first programmable divider and frequency converts the received TV signal into an intermediate-frequency signal having a predetermined frequency, wherein

a dividing rate of the first programmable divider is variable and set to 1 to receive the TV signal having a predetermined frequency band and to 1/2 or less to receive a TV signal having a frequency band lower than the predetermined frequency band.

2. A TV signal receiving tuner for receiving TV signals by dividing them into a plurality of frequency bands, comprising:

a local oscillator which oscillates at a frequency range corresponding to a TV signal having a predetermined

frequency band;

a second programmable divider which receives a local oscillation signal of the local oscillator and divides the local oscillation signal;

a second mixer which mixes the received TV signal and the local oscillation signal and frequency converts the received TV signal into an intermediate-frequency signal having a predetermined frequency; and

a third mixer which mixes the received TV signal and the output of the second programmable divider and frequency converts the received TV signal into an intermediate-frequency signal having a predetermined frequency,

wherein frequency conversion is carried out by the second mixer to receive the TV signal having a predetermined frequency band, and

wherein frequency conversion is carried out by the third mixer to receive the TV signal having a frequency band lower than the predetermined frequency band.

3. The TV receiving tuner according to claim 2, wherein a dividing rate of the second programmable divider is variable and changed according to an area where it is used.

4. The TV receiving tuner according to claim 1, wherein a first tracking filter for selecting the TV signal

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having a predetermined frequency band and a second tracking filter for selecting the TV signal having a frequency band lower than the predetermined frequency band are arranged in parallel to each other, wherein a PLL IC for outputting a tuning voltage for changing the frequency of the local oscillation signal output from the local oscillator is provided, and wherein the tuning voltage is applied to the first tracking filter and the second tracking filter to tune a pass band of the first tracking filter or the second tracking filter to a frequency of a TV signal to be received.

5. The TV receiving tuner according to claim 4, wherein the first tracking filter and the second tracking filter are a multi-tuning circuit.

6. The TV receiving tuner according to claim 5, wherein a low-noise first preamplifier having an AGC function is provided after the first tracking filter, and wherein a low-noise second preamplifier having an AGC function is provided after the second tracking filter.

7. The TV receiving tuner according to claim 6, wherein a first image trap circuit for attenuating an image frequency signal corresponding to a TV signal to be received is interposed between the first preamplifier and the second mixer, and wherein a second image trap circuit

for attenuating an image frequency signal corresponding to a TV signal to be received is interposed between the second preamplifier and the third mixer.

8. The TV receiving tuner according to claim 1, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 847 to 505 MHz, and wherein the dividing rate of the first programmable divider can be changed to at least 1, 1/3 and 1/5.

9. The TV receiving tuner according to claim 1, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 803 to 473 MHz, and wherein the dividing rate of the first programmable divider can be changed to at least 1, 1/3 and 1/9.

10. The TV receiving tuner according to claim 1, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 824 to 530 MHz, and wherein the dividing rate of the first programmable divider can be changed to at least 1, 1/3 and 1/4.

11. The TV receiving tuner according to claim 1, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 767 to 473 MHz, and wherein the dividing rate of the first programmable divider can be changed to at least 1, 1/3 and 1/6.

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12. The TV receiving tuner according to claim 2, wherein the tuner comprises a third programmable divider for receiving the oscillation signal of the local oscillator and dividing the oscillation signal and a fourth mixer for mixing the received TV signal and the output of the third programmable divider and frequency converting the received TV signal into an intermediate-frequency signal having a predetermined frequency, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 847 to 505 MHz, wherein the dividing rate of the second programmable divider is  $1/3$ , and wherein the dividing rate of the third programmable divider is  $1/5$ .

13. The TV receiving tuner according to claim 2, wherein the tuner comprises a third programmable divider for receiving the oscillation signal of the local oscillator and dividing the oscillation signal and a fourth mixer for mixing the received TV signal and the output of the third programmable divider and frequency converting the received TV signal into an intermediate-frequency signal having a predetermined frequency, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 803 to 473 MHz, wherein the dividing rate of the second programmable divider is  $1/3$ , and wherein the dividing rate

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of the third programmable divider is  $1/9$ .

14. The TV receiving tuner of claim 2, wherein the tuner comprises a third programmable divider for receiving the oscillation signal of the local oscillator and dividing the oscillation signal and a fourth mixer for mixing the received TV signal and the output of the third programmable divider and frequency converting the received TV signal into an intermediate-frequency signal having a predetermined frequency, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 824 to 530 MHz, wherein the dividing rate of the second programmable divider is  $1/3$ , and wherein the dividing rate of the third programmable divider is  $1/4$ .

15. The TV receiving tuner according to claim 2, wherein the tuner comprises a third programmable divider for receiving the oscillation signal of the local oscillator and dividing the oscillation signal and a fourth mixer for mixing the received TV signal and the output of the third programmable divider and frequency converting the received TV signal into an intermediate-frequency signal having a predetermined frequency, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 767 to 473 MHz, wherein the dividing rate of the second

programmable divider is  $1/3$ , and wherein the dividing rate of the third programmable divider is  $1/6$ .

16. The TV receiving tuner according to claim 2, wherein a first tracking filter for selecting the TV signal having a predetermined frequency band and a second tracking filter for selecting the TV signal having a frequency band lower than the predetermined frequency band are arranged in parallel to each other, wherein a PLL IC for outputting a tuning voltage for changing the frequency of the local oscillation signal output from the local oscillator is provided, and wherein the tuning voltage is applied to the first tracking filter and the second tracking filter to tune a pass band of the first tracking filter or the second tracking filter to a frequency of a TV signal to be received.

17. The TV receiving tuner according to claim 16, wherein the first tracking filter and the second tracking filter are a multi-tuning circuit.

18. The TV receiving tuner according to claim 17, wherein a low-noise first preamplifier having an AGC function is provided after the first tracking filter, and wherein a low-noise second preamplifier having an AGC function is provided after the second tracking filter.

19. The TV receiving tuner according to claim 18, wherein a first image trap circuit for attenuating an image frequency signal corresponding to a TV signal to be received is interposed between the first preamplifier and the second mixer, and wherein a second image trap circuit for attenuating an image frequency signal corresponding to a TV signal to be received is interposed between the second preamplifier and the third mixer.

20. The TV receiving tuner according to claim 16, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 847 to 505 MHz, and wherein the dividing rate of the first programmable divider can be changed to at least 1,  $1/3$  and  $1/5$ .

21. The TV receiving tuner according to claim 16, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 803 to 473 MHz, and wherein the dividing rate of the first programmable divider can be changed to at least 1,  $1/3$  and  $1/9$ .

22. The TV receiving tuner according to claim 16, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 824 to 530 MHz, and wherein the dividing rate of the first programmable divider can be changed to at least 1,  $1/3$  and  $1/4$ .



23. The TV receiving tuner according to claim 16, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 767 to 473 MHz, and wherein the dividing rate of the first programmable divider can be changed to at least 1,  $1/3$  and  $1/6$ .

24. The TV receiving tuner according to claim 4, wherein the tuner comprises a third programmable divider for receiving the oscillation signal of the local oscillator and dividing the oscillation signal and a fourth mixer for mixing the received TV signal and the output of the third programmable divider and frequency converting the received TV signal into an intermediate-frequency signal having a predetermined frequency, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 847 to 505 MHz, wherein the dividing rate of the second programmable divider is  $1/3$ , and wherein the dividing rate of the third programmable divider is  $1/5$ .

25. The TV receiving tuner according to claim 4, wherein the tuner comprises a third programmable divider for receiving the oscillation signal of the local oscillator and dividing the oscillation signal and a fourth mixer for mixing the received TV signal and the output of the third programmable divider and frequency converting the received TV signal into an

intermediate-frequency signal having a predetermined frequency, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 803 to 473 MHz, wherein the dividing rate of the second programmable divider is  $1/3$ , and wherein the dividing rate of the third programmable divider is  $1/9$ .

26. The TV receiving tuner according to claim 4, wherein the tuner comprises a third programmable divider for receiving the oscillation signal of the local oscillator and dividing the oscillation signal and a fourth mixer for mixing the received TV signal and the output of the third programmable divider and frequency converting the received TV signal into an intermediate-frequency signal having a predetermined frequency, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 824 to 530 MHz, wherein the dividing rate of the second programmable divider is  $1/3$ , and wherein the dividing rate of the third programmable divider is  $1/4$ .

27. The TV receiving tuner according to claim 4, wherein the tuner comprises a third programmable divider for receiving the oscillation signal of the local oscillator and dividing the oscillation signal and a fourth mixer for mixing the received TV signal and the output of the third programmable divider and frequency

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converting the received TV signal into an intermediate-frequency signal having a predetermined frequency, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 767 to 473 MHz, wherein the dividing rate of the second programmable divider is  $1/3$ , and wherein the dividing rate of the third programmable divider is  $1/6$ .

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